TOWN OF LEDYARD

LOCAL TRANSPORTATION CAPITAL IMPROVEMENT PROGRAM APPLICATION (LOTCIP)

A Town for all Seasons

Prepared For:

THE TOWN OF LEDYARD

PUBLIC WORKS DEPARTMENT
741 COLONEL LEDYARD HIGHWAY
LEDYARD, CONNECTICUT

Prepared by:
Wengell, McDonnell & Costello
-Consulting Engineers-
87 Holmes Road
Newington, Connecticut 06111

WMC
CONSULTING ENGINEERS
NEWINGTON, CT • (860) 667-9624

Table of Contents

1. Final LOTCIP Application

2. Location Map

3. LOTCIP Application Section A-2 – Supporting Photos

4. LOTCIP Application Section A-4 – Project Concept Level Plans

5. LOTCIP Application Section F – Pedestrian/Bicycle Safety and Mobility

6. LOTCIP Application Section G - Traffic

7. LOTCIP Application Section J – Estimate

8. LOTCIP Application Section K – Roadway Geometric Improvements

9. LOTCIP Application Section M – Latest Bridge Inspection Report

10. LOTCIP Application Section O – Pavement Structure Improvement

11. LOTCIP Application Section Q – Other

1. Final LOTCIP Application

Connecticut Department of Transportation

Local Transportation Capital Improvement Program Application

Municipality:	Ledyard	COG: SCCOG
Route/Road:	Lantern Hill Road	
Project Title:	Lantern Hill Road over Whitford Brook (Bridge 71009)	
Roadway Functional Classification (if applicable):	Major Collector	
COG Contact Information:	Amanda Kennedy	Executive Director
	Name	Title
	(860) 889-2324	akennedy@seccog.org
	Phone Number	Email
Municipal Contact Information:	Steve Masalin	Director of Public Works
	Name	Title
	860-464-3238	pwd@ledyardct.org
	Phone Number	Email

The applicant must answer the questions below which are intended to address basic issues about existing conditions, project management, project costs, impacts on private property, utilities, wetlands, etc. You may provide your answer in the space provided below or submit separate answer sheets. **It is important that the application be as thorough as possible, as missing information will delay the review process. All project- related sections must be completely filled out or the application will be returned and will require resubmittal.**

The intent of the application is to establish eligibility, service life, and to ensure the Municipality is considering all pertinent aspects associated with major infrastructure improvements consistent with the purpose and need of the project.

(A) Project Information

1. Select the type of proposed improvement (select all that apply):

Please note: The entire application must be completed for all projects in addition to any necessary supplemental sections (K through P) as determined by the type of project.

- ☑ Roadway Geometric Improvement
- ☐ Stand-Alone Sidewalk Construction
- ☑ Bicycle/Pedestrian Improvement, including Multi-Use Trail Facilities
- ☐ Intersection Improvement

  Provide additional information as required in section L

- ☑ Bridge Rehabilitation/Replacement

  Provide additional information as required in section M

- ☐ Major Drainage Improvement

  Provide additional information as required in section N

- ☑ Pavement Structure Improvement

  Provide additional information as required in section O

- ☐ Traffic Signal Replacement/Upgrade/New Installation/Coordination

  Provide additional information as required in section P

- ☑ Other (please specify): Improve flood conditions by making culvert

  Provide additional information as required in section Q

2. Describe the purpose and need of the project (i.e., what are the problems to be corrected?). Please provide adequate detail to clearly convey the nature of the problem(s) to be corrected. Provide photographs to document the existing conditions and support the purpose and need. (Attachments acceptable)

   Bridge No. 71009 carries Lantern Hill Road over the Whitford Brook and was built 75 years ago in 1950. The bridge consists of two asphalt coated corrugated metal pipes (CMPs) 5-ft in diameter. The headwalls and wingwalls are constructed of stone masonry. The bridge carries one lane of traffic in each direction with an overall curb-to-curb width of approximately 24 feet. There is metal beam rail on both sides of the bridge with no sidewalks.

   The bridge was inspected in 2024 and was found to be in poor condition (Condition Rating = 4) overall. The upstream west pipe was damaged due to what appears to be metal beam rail post driven through its top chord. The stone masonry wingwalls exhibit missing stones that have fallen into the brook. The structure is subject to flooding and overtopping, and has experienced significant failure in the past (in the March 2010 regional flooding event) leading to scouring of retaining walls, which were temporarily repaired by municipal forces.

   This is a bike route identified in the 2019 SECOG Regional Bike and

3. Provide a project description, including project limits and length, that specifically describe how the proposed improvements will correct the problem(s) identified in the purpose and need. Describe what alternative(s) were considered. (Attachments acceptable)

   This project will involve removing the existing bridge and installing a new prestressed deck slab structure, abutments, and wingwalls. The proposed project will improve flood conditions, as the new bridge will be designed to be wider and more hydraulically efficient. The wider, open design will be less prone to blockage by debris compared to the existing CMPs. The new abutment and wingwalls will prevent erosion and scouring, and will provide structural integrity. The proposed project is in-line with 2023 SCCOG Hazard Mitigation and Climate Adaption Plan goals and objectives to “reduce flood and erosion risks by reducing vulnerabilities and consequences.” The proposed project supports inclusion of context sensitive facilities for cyclists and pedestrians, as a 5-ft marked bike lane/shoulder and 5-ft sidewalk will be included on the southbound side. The proposed project will improve roadside safety, as it includes the installation of new metal beam guide rails and end anchorages that extend further from the bridge. It will include the reconstruction of approximately 200 linear feet of roadway on both sides of the bridge, as well as a new bituminous concrete wearing surface over the bridge.

4. Provide concept plans of the proposed improvement. The plans must be sufficiently developed and provide enough detail on a scaled drawing (including aerial photography base mapping if possible) to identify the following:

Inc.	N/A	
☑		Project location
☑		Limits of project
☑	☐	Approximate limits and extent of any pavement widening or realignment
☑	☐	Proposed number of lanes, widths, and arrangements
☑	☐	Approximate limits and extent of any anticipated ROW acquisitions (based on available ROW information from Assessors maps, GIS data, etc.)
☑	☐	Structures (e.g., Retaining walls, bridges)
☑	☐	Watercourses
☑	☐	Typical Cross Section including lane and shoulder widths, pavement structure, etc.

5. Have the improvements at this location been previously submitted to the Department for funding? ☐ No ☑ Yes

   If yes, when and under what program?

   State Local Bridge Program Funding

6. Have any other Federal or State funding sources been applied for or awarded for the improvements at this location?

   If yes, please list source, amount, and when awarded in detail below:

   No, the previous funding application submittal was denied.

7. Does the project impact any State-owned Facilities (e.g., roads, bridges, etc.)?
   ☑ No ☐ Yes

   If yes, describe the impacts:

8. In the area of the project, are there any known proposed developments?

   ☑ No ☐ Yes

   If yes, describe the proposed developments:

9. Design Standards to be used:

   ☑ Established municipal standards

   ☑ AASHTO Policy on Geometric Design of Highways and Streets

   ☑ Connecticut Department of Transportation Highway Design Manual

   ☑ AASHTO LRFD Bridge Design Specifications and Connecticut Department of Transportation Bridge Design Manual

   ☐ Other, please specify: _____

(B) Rights of Way

1. Are any Right of Way (ROW) impacts anticipated? ☐ No ☑ Yes

   If yes, describe the nature, extent, and type of impacts:

   Defined Easement or Permanent Taking Area for widening the road and construction of bridge and wingwalls.

   Construction Easements for construction of the bridge and placement of equipment and materials.

2. If ROW acquisitions will be required, who does the Municipality plan to have perform acquisition activities?

   ☑ Municipal staff ☐ Consultant hired by Municipality ☐ State

3. If ROW acquisitions are to be performed by the Municipality's staff or their consultant, will the Municipality be seeking reimbursement for ROW costs?

   ☐ No ☑ Yes

(C) Utilities

1. List all utilities within the project area, including their owners.

Overhead	Underground
Eversource Electric	none
Frontier Communication	
Comcast	

2. Are any utility impacts anticipated? ☐ No ☑ Yes

   If yes, explain the nature and extent of the impacts:

   Overhead utilities will need to be temporarily relocated for the reconstruction of the bridge

   Note: Costs associated with utility betterments/upgrades that are not required to accommodate the proposed transportation improvement are not eligible project costs.

3. Have the utility companies been contacted to identify any plans to expand or improve existing utilities that would compromise the service life of the proposed improvements?

   ☐ No ☑ Yes

   If yes, describe any proposed improvements and their schedule:

   Utility companies were contacted and there are no proposed plans to expand or improve existing utilities.

(D) Storm water drainage system and under drains

1. Do any existing storm water drainage problems exist? ☑ No ☐ Yes

   If yes, describe the problem(s):

2. Is any storm water drainage system work anticipated, including any new or modified drainage outlets? ☑ No ☐ Yes

   If yes, explain the nature and extent of the improvements:

3. Are there any existing watercourse crossings that are proposed to be modified, rehabilitated, or replaced as part of the project? ☐ No ☑ Yes

   If yes, indicate the type of improvement needed and the reason for it. Please also indicate if any existing watercourse crossings have inadequate hydraulic capacity:

   The existing water course is hydraulically inadequate. The proposed bridge will widen the channel and improve flow through the structure.

(E) Rail Crossings

1. Are there any railroad crossings that are likely to be impacted as part of the project?

   ☑ No ☐ Yes
   ☐ At-grade
   ☐ Grade separated

   If yes, describe impacts and any necessary modifications:

(F) Pedestrian/Bicycle Safety and Mobility

1. Complete and attach the Department's Bicycle and Pedestrian Needs Assessment Form to this application (a copy of this form is included in Appendix D). In accordance with Connecticut General Statutes, Section 13a-153f, and the Department's focus on accommodating non-motorized travel modes, accommodation of all users shall be a routine part of the planning, design, construction, and operating activities of all highways. The need for inclusion of accommodations for bicyclists and pedestrians, including those with disabilities, must be reviewed for every project, regardless of funding source.

(G) Traffic

The information below needs to be provided or reviewed (as specified) by the designer for all project types except for stand-alone sidewalk projects and bicycle/pedestrian improvements, and multi-use trail facilities that do not involve pedestrian crossings

1. Volumes

   Provide existing and 20-year Projected ADTs and Turning Volumes. Refer to the Preliminary Engineering/Preliminary Design section for guidance on traffic volumes.

2. Crash Experience

   Provide a summary of crash experience using the most current three-year data, including a crash summary diagram, and analysis noting any discernable crash patterns.

3. Traffic Signals

   Review the existing traffic signal plans for projects involving signalized intersections

4. Speed Data

   Provide 85^{th} percentile speeds in the project area

   Provide all posted speed limits in the project area

(H) Environmental Resource Involvement

Refer to Application Process/Preliminary Project Submittals - Information provided by the Department for more information.

1. Parks, Cemeteries, Historic Structures

   a. Are there any parks, cemeteries, or historic structures that are likely to be affected by the project? ☑ No ☐ Yes

If yes, describe the type and extent of the anticipated impact.

2. Wetlands

   a. Are there any wetlands that are likely to be affected by the project?

      ☐ No ☑ Yes

      If yes, describe the type and extent of the anticipated impact.

      Impacts to the wetland include temporary cofferdams, grading, and construction of the new concrete bridge.

3. Hazardous or Contaminated Sites

   a. Has the potential for hazardous or contaminated sites and materials in the project area been investigated? ☑ No ☐ Yes

      If yes, describe the type and extent of the anticipated impact.

(I) Public Involvement

Refer to Preliminary Engineering/Project Design - Public Involvement section for more information.

1. Has public involvement been conducted? ☑ No ☐ Yes

   If yes, describe the public involvement effort, when it was conducted, and any public support or opposition to the project:

   Public outreach will be initiated at the 30% design stage via a Public Information Meeting. Sufficient notice prior to the meeting and an opportunity for public comment after the meeting will be provided. Abutting property owners will be notified by direct mailing. Information will be posted on the municipalities website, and a press release to local media outlets identifying the basic project information will be provided.

If no, describe the planned public involvement effort should the project move forward:

Though there has been no direct public involvement in this particular application, there has been considerable ongoing involvement in a broader Whitford Brook watershed infrastructure improvements initiative. Replacement of this bridge is one of the particular aspects that is being advanced. A public information meeting will be conducted upon completion of the preliminary design phase of the project as part of the LoTCIP approach.

(J) Cost Estimate

1. Attach a preliminary cost estimate identifying:
    a. Approximate quantities and assumed unit prices of the major contract items
    b. An allowance for minor items (percentage of a)
    c. Standard lump sum items (e.g., clearing and grubbing, mobilization, construction staking, maintenance and protection of traffic), as applicable (percentages of a + b)
    d. Total contract items (a + b + c)
    e. Contingencies (10% of d)
    f. Incidentals to construction, (e.g., construction inspection, materials testing) (10% of d)
    g. Rights of Way costs
    h. Eligible utility relocation costs (in accordance with CGS 13a-98f)
    Note: Costs associated with utility betterments/upgrades that are not required to accommodate the proposed transportation improvement are not eligible project costs
    i. Total project costs (d + e + f + g + h)

Sample cost estimate form provided in Appendix C and the Excel spreadsheet is available for download from the Department's LOTCIP webpage:

https://portal.ct.gov/DOT/Office-of-Engineering/Highway-Design---Local-Roads---LOTCIP

Refer to the Department's most current Cost Estimating Guidelines for cost estimate guidance or use town-generated unit prices. The anticipated costs for each phase of the project shall be well documented and based on reasonable anticipated costs.

The guidelines are located at:

https://portal.ct.gov/DOT/Engineering-Applications/Submissions---Cost-Estimating

ADDITIONAL INFORMATION TO BE PROVIDED BASED ON IMPROVEMENT TYPE SELECTED IN SECTION (A)1:

(K) Roadway Geometric Improvements

Proposed Design Speed

(L) Intersection Improvements

Capacity Analyses (For build and no-build conditions using existing and projected traffic volumes).*

(M) Bridge Rehabilitation/Replacement

Latest Condition Report

(N) Major Drainage Improvement

Material, Age, Hydraulic adequacy assessment of existing drainage system (Condition Report, post-cleaning is preferred)

(O) Pavement Structure Improvement

The level of investigation will be dependent upon the proposed improvements. **Cores or test pits must be performed** such that a representative sample of the existing roadway condition is obtained. If varying pavement conditions exist along the roadway indicating the possibility of different pavement conditions, a test pit should be performed in each roadway section. **Pavement thickness and type, sub-base thickness and type**, and the presence of fines and/or groundwater must be noted. Attach the data obtained. If full depth reconstruction is proposed, cores or test pits may be required to justify the scope of the proposed improvements.

Approximate percentage of heavy vehicles: 5%

What is the existing pavement type, condition, and thickness?

Flexible Bituminous Concrete Pavement, Poor

What is the anticipated pavement design? Describe the type and depth of each course including the base that is suitable for the ADT and percentage of heavy vehicles. Does it meet current design standards? Describe the cross-section (e.g., lanes and shoulder widths, etc.).

20-year Design, ADT = 800 vpd, Rural Major Collector, 5% Trucks,
10-ft Travel Lanes, 5-ft Bike Lanes, 5-ft Sidewalk with 6" Curb
6" HMA S0.5 (Level 2 in 3 Equal Lifts) over 14" of Subbase (20" in Rock Cut)

Describe how the service life requirement for the proposed pavement design was determined:

A 20-year service life was used for the ESAL calculations as required for LOTCIP projects.

(P) Traffic Signal Replacement/Upgrade/New Installation/Coordination

Who is/will be responsible for ownership, maintenance, and electrical costs

Age of existing signals

Capacity Analyses (For build and no-build conditions using existing and projected traffic volumes)*

Warrant Analysis for new signals

Systems Engineering Analysis Form (SEAFORM) for Intelligent Transportation Systems (ITS) projects

(Q) Other

To be determined based on type of improvement proposed.

***Capacity Analysis:** For the purposes of this application, a simplified analysis may be performed for signalized intersections that do not require detailed assumptions, proprietary software or specialized traffic engineering skills. The "Quick Estimation Method" is described in detail in the 2010 Highway Capacity Manual, with accompanying worksheets that can be completed by hand. A brief description of the method is also described in Section 3.3.6 of the FHWA Signal Timing Manual, where it is referred to as a "Critical Movement Analysis." The relevant section of the FHWA publication can be accessed at: http://ops.fhwa.dot.gov/publications/fhwahop08024/chapter3.htm

This simplified analysis will yield an approximate critical volume/capacity ratio that can be used to assess overall operation of the intersection. The build and no-build conditions should be analyzed for the existing and projected traffic volumes.

APPLICATION SUBMISSION

This application and supporting documents must be submitted by the Municipality to their COG. At such time when the application is to be forwarded to the Department of Transportation by the COG, it must be forwarded electronically to:

DOTLOTCIPapp@ct.gov

Prepared by: Keegan Elder, P.E. Date: 12/19/2025

Name, Title, and stamp of Responsible P.E. (Municipal or Consultant)

Keegan O. Elder

Signature



Reviewed/Recommended by: _____ Date: _____

Name and Title of Municipal Chief Administrative Officer

_____

Signature

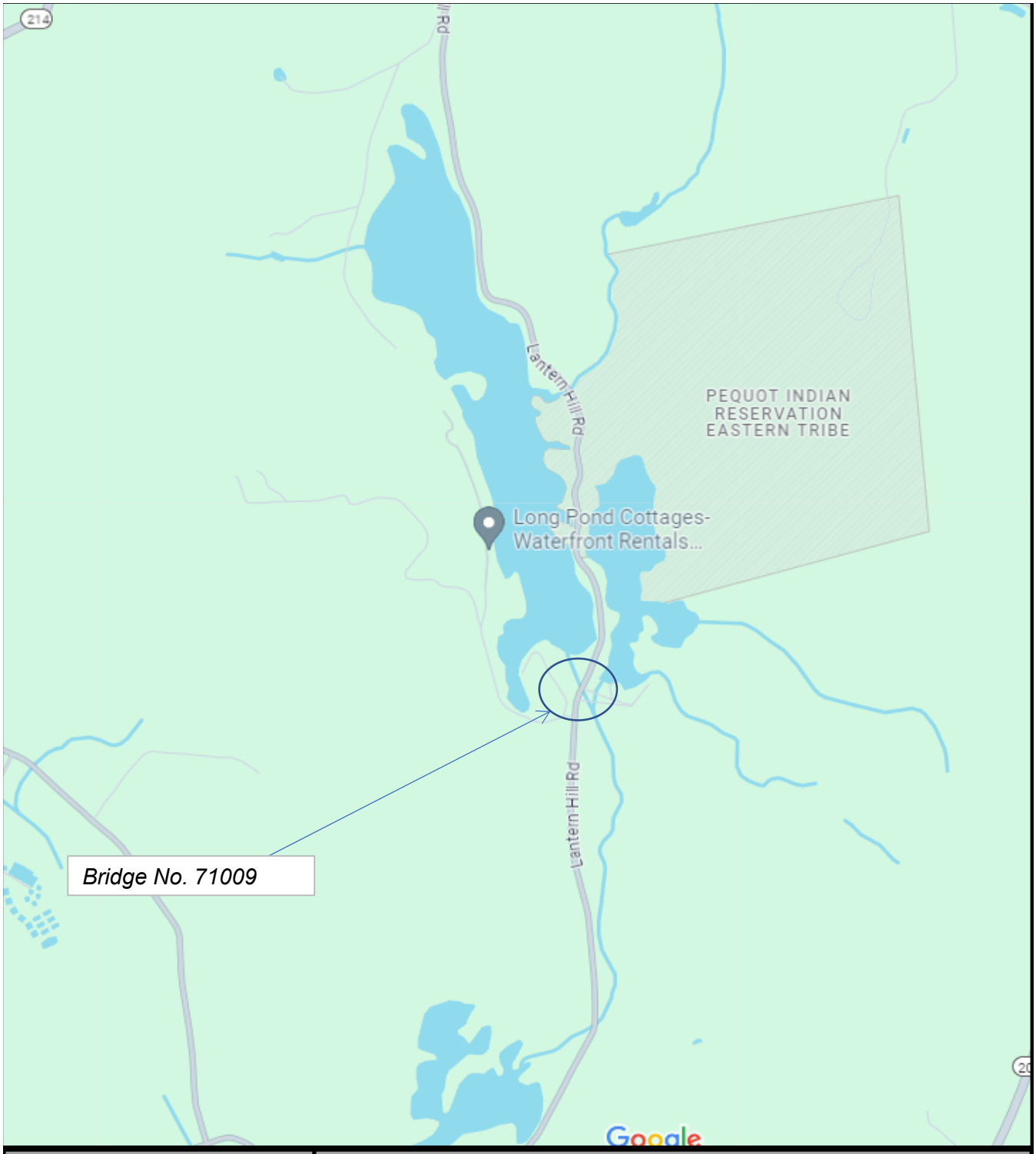
Endorsed/Recommended by: _____ Date: _____

Name and Title of COG Executive Director

_____

Signature

2. Location Map



WMC
CONSULTING ENGINEERS

Wengell, McDonnell & Costello
-Consulting Engineers-
87 Holmes Road
Newington, Connecticut 0611

THE TOWN OF LEDYARD

LANTERN HILL ROAD
Over
WHITFORD BROOK
Bridge No. 71009
Location Map

3. LOTCIP Application Section A-2 – Supporting Photos



1. Roadway Looking East



2. Roadway Look West



3. Upstream Bridge Elevation View



4. Downstream Bridge Elevation View



5. Upstream Channel



6. Downstream Channel



7. Typical Metal Beam Rail over Culvert



8. Damaged Metal Beam Rail



9. Inside East Pipe



10. Inside West Pipe



11. Upstream West Pipe Damage



12. Typical Headwall Joint Section Loss

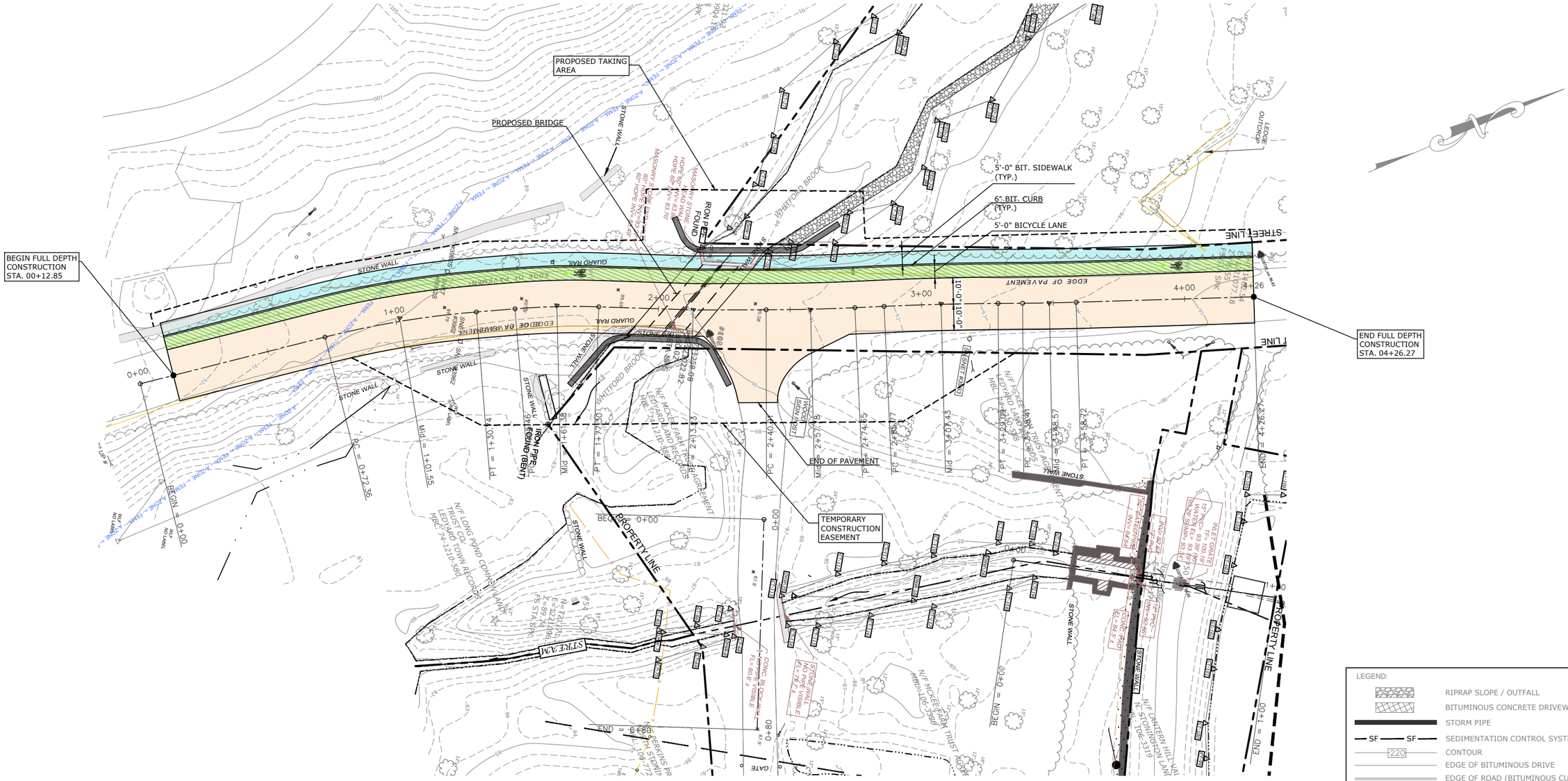


13. Typical Wingwall Missing Stone (All four Wingwalls)



14. Culvert-Wingwall Interface Damage

4. LOTCIP Application Section A-4 – Project Concept Level Plans



PROPOSED ROADWAY PLAN

SCALE: 1" = 20'-0"

LEGEND:

- RIPRAP SLOPE / OUTFALL
- BITUMINOUS CONCRETE DRIVEWAY
- STORM PIPE
- SF — SF — SEDIMENTATION CONTROL SYSTEM
- 220 CONTOUR
- EDGE OF BITUMINOUS DRIVE
- EDGE OF ROAD (BITUMINOUS CURB)
- C — F APPROXIMATE CUT/FILL LIMITS (COINCIDENT WITH TREE CLEARING)
- EDGE OF BITUMINOUS DRIVE
- APPROXIMATE BORING LOCATION
- CATCH BASIN / CATCH BASIN TOP
- DRAINAGE MANHOLE
- TREE TO BE REMOVED

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)

1 inch = 20 ft.

NO.	DATE	DESCRIPTION

REVISIONS

SUPV.	S.R.M.
DESIGN	D.T.J.
DRAWN	D.T.J.
CHECKED	M.E.F.
DATE	11/13/25

PRELIMINARY REVIEW

WMC CONSULTING ENGINEERS

• WENGELL, McDONNELL & COSTELLO •
87 HOLMES ROAD
NEWINGTON, CT 06111
(860) 667-9624

PREPARED FOR

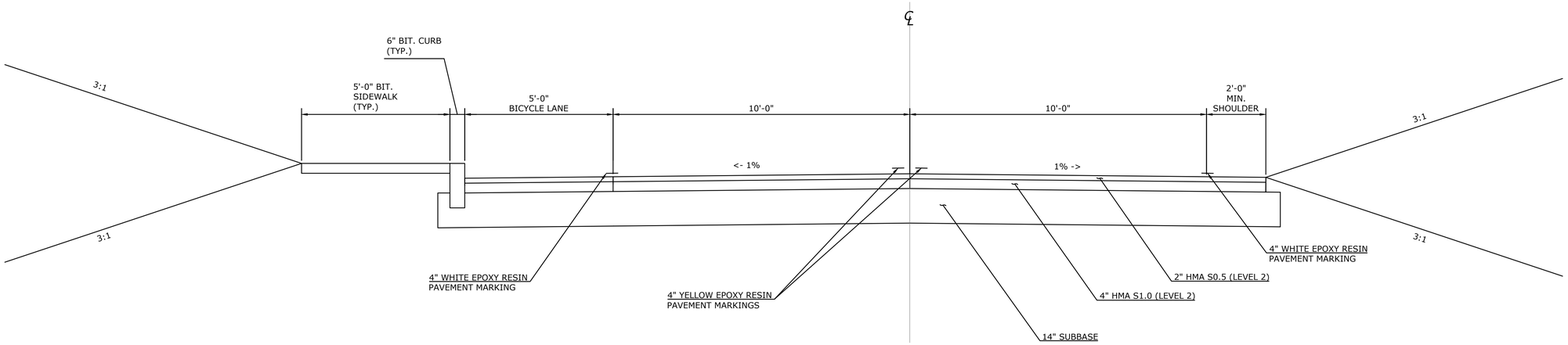
TOWN OF LEDYARD

741 COLONEL LEDYARD HIGHWAY

LEDYARD, CT 06339

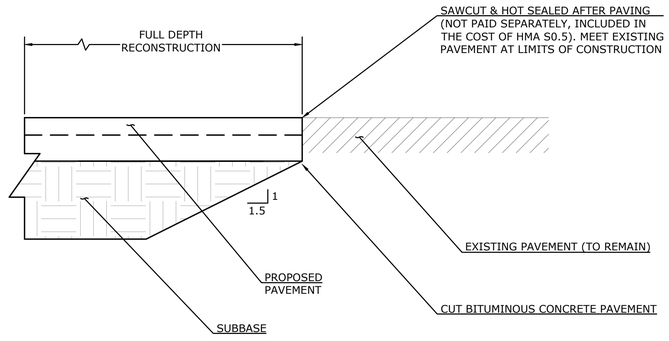
REPLACEMENT OF LANTERN HILL ROAD BRIDGE #071009 OVER WHITFORD BROOK

SIZE	PROJECT	FILE NAME	NUMBER	REV.	SHEET	OF
D	LANTERN HILL	P.D.	23016		1	3



TYPICAL ROADWAY SECTION
LANTERN HILL ROAD

SCALE: 1/2" = 1'-0"



TYPICAL ROADWAY PAVEMENT TRANSTION DETAIL AT CONSTRUCTION LIMITS

SCALE: NOT TO SCALE

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

NO.	DATE	DESCRIPTION

REVISIONS

SUPV.	S.R.M.
DESIGN	D.T.J.
DRAWN	D.T.J.
CHECKED	M.E.F.
DATE	11/13/25

PRELIMINARY REVIEW

WMC CONSULTING ENGINEERS

• WENGELL, McDONNELL & COSTELLO •
87 HOLMES ROAD
NEWINGTON, CT 06111
(860) 667-9624

PREPARED FOR

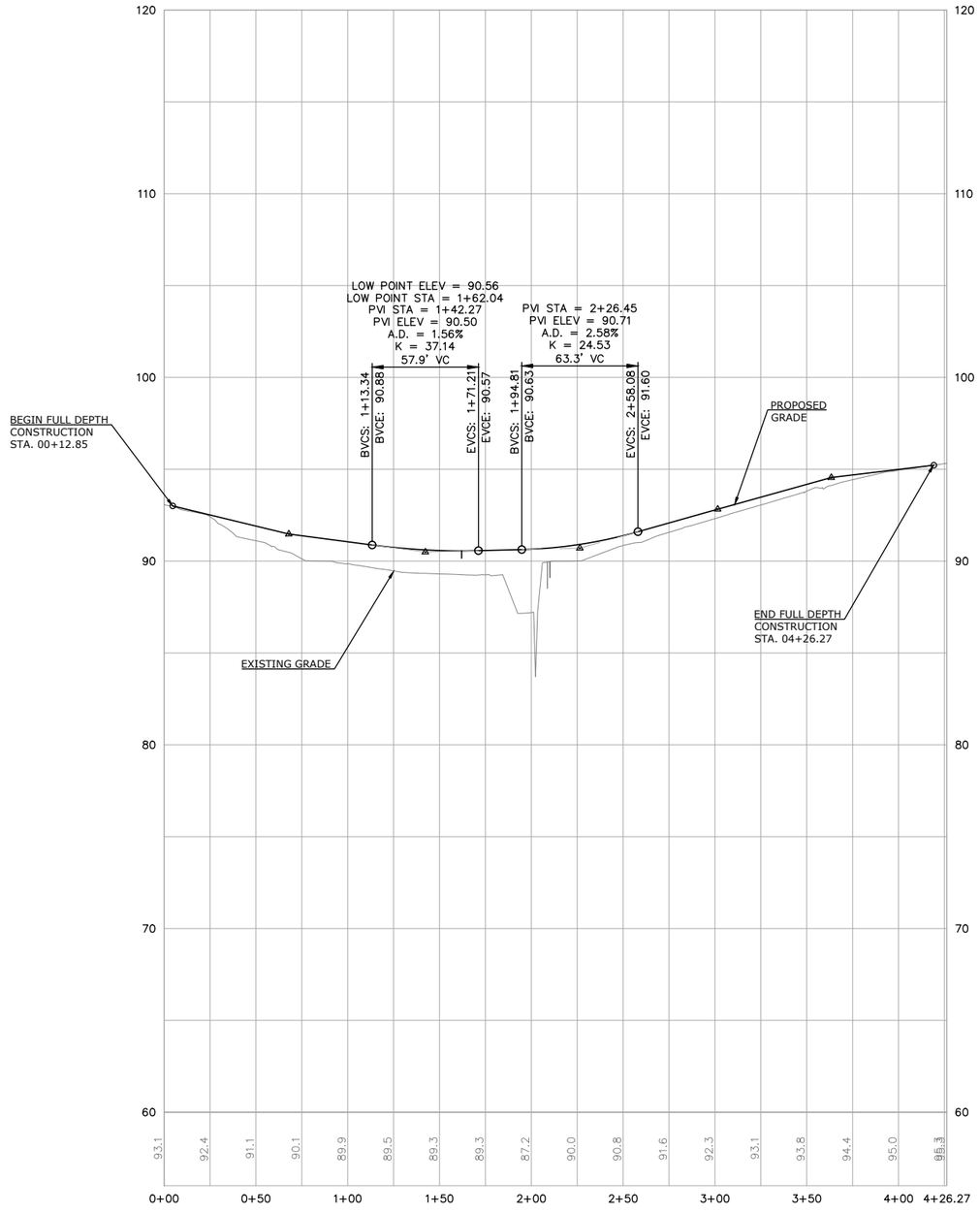
TOWN OF LEDYARD

741 COLONEL LEDYARD HIGHWAY

LEDYARD, CT 06339

REPLACEMENT OF LANTERN HILL ROAD
BRIDGE #071009
OVER WHITFORD BROOK

SIZE	PROJECT	FILE NAME	NUMBER	REV.	SHEET	OF
D	LANTERN HILL	P.D.	23016		2	3



PROFILE

SCALE: 1" = 20'-0"

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

NO.	DATE	DESCRIPTION

REVISIONS

SUPV.	S.R.M.
DESIGN	D.T.J.
DRAWN	D.T.J.
CHECKED	M.E.F.
DATE	11/13/25

PRELIMINARY REVIEW

WMC CONSULTING ENGINEERS

• WENGELL, McDONNELL & COSTELLO •
87 HOLMES ROAD
NEWINGTON, CT 06111
(860) 667-9624

PREPARED FOR

TOWN OF LEDYARD
741 COLONEL LEDYARD HIGHWAY
LEDYARD, CT 06339

REPLACEMENT OF LANTERN HILL ROAD
BRIDGE #071009
OVER WHITFORD BROOK

SIZE	PROJECT	FILE NAME	NUMBER	REV.	SHEET OF
D	LANTERN HILL	P.D.	23016		3 OF 3

5. LOTCIP Application Section F – Pedestrian/Bicycle Safety and Mobility

CONNECTICUT DEPARTMENT OF TRANSPORTATION

BICYCLE AND PEDESTRIAN TRAVEL NEEDS ASSESSMENT FORM (BPTNA)



In accordance with Connecticut General Statutes, Section 13a-153f, Accommodations and Provisions of Facilities for All Users and the Department's Policy Statement No. EX.0-31, It is the policy of the Department to consider the needs of all users of all abilities and ages (specifically including pedestrians, bicyclists, transit users, and vehicle operators) in the planning, programming, design, construction, retrofit and maintenance activities related to all roads and streets as a means of providing a "safe, efficient transportation network which enhances quality of life and economic vitality." Therefore, the need for inclusion of accommodations specifically for bicyclists and pedestrians, including those with disabilities, must be reviewed for **every** project.

This form shall apply to all Department projects, mainline utility projects within the state right-of-way, the Office of the State Traffic Administration (OSTA) certificate applications receiving state or federal funding, and municipal transportation projects that receive state or federal funding. This form provides designers the documentation and information needed to make decisions on the need and extent of bicycle and pedestrian features that should be included in a project. This form is not intended to dictate what features should be included in a project design, as guidance on those questions can be found in numerous other reference documents. This form should be completed to the extent practical (at least Sections 1 & 2) during the project scoping phase and finalized by the completion of the Preliminary Design. Once signed, this form should be retained with the project documents.

Project Number(s):	TBD	Route(s):	Lantern Hill Road
Project Name:	Lantern Hill Rd over Whitford Brook		
Municipality(s):	Ledyard	Planning Region(s):	SCCOG

SECTION 1: APPLICABILITY

Although bicycle and pedestrian accommodations should be considered for all projects, certain types of projects (e.g. bridge deck patching, culvert re-lining, projects on expressway mainlines) do not typically provide reasonable opportunity to provide improvements for these travel modes. Considering the project type answer the question below. If the question below is answered **no**, please explain why, then skip to the last page, sign the form, and file this form with the project documents. If the answer is **yes**, go to Section 2 and complete the rest of the form.

Does this project type provide reasonable opportunity to provide improvements for non-motorized access?	Yes ☑ No ☐
If no, why?	

SECTION 2: ASSESSMENT OF STUDY AREA

2.1 Study Area Map

Identify any non-motorized and/or transit generators located within the Study Area (Study Area is generally defined as approximately ½ mile radius from the project limits). Using the letters in the code column below, create a map from a location plan or aerial photograph indicating the location of existing or planned non-motorized or transit user generators identified below (for planned facilities, precede the letter with a P-).

Non-Motorized/Transit User Generators	Code
Residential Areas: Indicate any general areas of dense residential housing	**R**
Parks: Include areas that would attract people, whether officially designated as a park or not	**P**
Recreational Areas: Examples include athletic fields, dog parks	**RA**
Religious Facilities	**C**
Schools (including public and private schools, colleges, universities, daycare or other educational institution)	**S**
Health / Medical Facilities	**H**
Town Centers: typically would include areas where Town Halls, Libraries and other public facilities exist	**TC**
Shopping Centers: especially centers with businesses where non-motorized customers might be expected (restaurants, bookstores, drug stores, etc.)	**M**
Large Employment Businesses: Factories, large office buildings, hospitals, government offices	**E**
Bus Stops	**B**
Public Transit Facilities: train/bus stations, airports	**T**
Shared-use trail access / parking	**TA**
Other: other known facilities expected to generate or attract non-motorized users Waterfront Cottage Rentals	**O**

Attachment Page Addressing Section F

(F) Pedestrian/Bicycle Safety and Mobility



Non-Motorized/Transit User Generators:

R – Residential Areas

O – Other (Waterfront Cottages

Map from aerial photograph indicating the location of existing areas within ½-mile of proposed bridge replacement project, as shown





Southeastern Connecticut Regional Bike & Pedestrian Plan showing this stretch of Lantern Hill Road as SCCOG recommended bike route

2.2 Analysis of Study Area		
Using the map prepared in Section 2.1, and the resources suggested below, answer the following questions about the study area. **[For State/District-wide or Division of Traffic Engineering projects with many locations use the "Multi-location BPTNA Table" at: https://portal.ct.gov/DOT/PP_Policy/Documents/BikePed_Dashboard to answer questions marked with an (*)]**		Explain as needed (attach additional sheet(s) if needed)
a. * Referencing the CTDOT Interactive Bike Map located at: http://www.ctbikepedplan.org/interactivemap.html is this project located on the Connecticut Statewide On-Road or Off-Road Bicycle Planning Network?	Yes ☐ No ☑	
b. * Have all existing bicycle, pedestrian and transit features within and just beyond the project limits (such as: features and ADA accessibility of existing bus stops, sidewalks, shoulder widths, bicycle markings/signs, shared-use paths, etc.) been identified and assessed for condition and need? (If assistance is needed identifying Transit requirements a request can be sent to: DOT.PTransBikePed@ct.gov)	Yes ☑ No ☐	
c. * Are there any areas of concern where physical impediments to non-motorized travel through the study area exist? Physical impediments can be excessive grade, limited width of roads/bridges, gaps or need for sidewalks (indicated by worn foot paths), utility poles or other appurtenances restricting access, etc.	Yes ☐ No ☑	
d. * Is there any reason to anticipate an increase in travel by non-motorized and /or transit users through the project limits in the future?	Yes ☑ No ☐	Yes, there are developmental plans that are anticipated to increase bike and pedestrian traffic in the vicinity.
e. * Based on the U.S. Access Board's Proposed Guidelines for Pedestrian Facilities in the Public Right-of-Way (PROWAG), are there barriers to mobility inhibiting continuous access between schools, hospitals, senior care, or community centers, etc. for persons with disabilities that **cannot** be addressed in this project?	Yes ☐ No ☑	
f. * Is there a pattern of bicycle or pedestrian crashes within the project area? Crash information can be found by accessing the UCONN Crash Repository at (https://www.ctcrash.uconn.edu/).	Yes ☐ No ☑	

g. Does the project provide <u>unique or primary access</u> (defined as access which is not otherwise available within approximately one-half mile of the project) : • across a river, highway corridor or other natural and/or man-made barrier? • into or out of any of the bicycle and pedestrian generators listed above? • between communities?	Yes ☐ No ☑ Yes ☑ No ☐ Yes ☑ No ☐	This stretch of Lantern Hill Road is the only major collector within one-half mile of the project. It is the only collector that connects these communities.
h. Is the project located near or provide new access or connectivity to state parks, forests or CT Designated Greenways? Information on State Parks, Forests and Greenways can be found at: http://www.ct.gov/deep/cwp/view.asp?a=2707&q=323852 and http://www.ct.gov/deep/parkmaps If yes, please notify the Trails and Greenways Program Coordinator at the Department of Energy & Environmental Protection, State Parks Division, by sending a location and description of the project to: deep.stateparks@ct.gov. This is for notification and not intended to be a formal review and /or concurrence.	Yes ☐ No ☑	
i. In accordance to the Complete Streets Policy, the Department will include non-motorized users in traffic counts to the extent possible. Has the existing pedestrian and/or bicyclist usage patterns within the project limits, particularly at intersection and midblock crossings, been observed / collected?	Yes ☐ No ☑	
j. Has there been any documented public concern or comments about non-motorized and/or transit needs in the area?	Yes ☐ No ☑	
k. Are there any comprehensive regional or local planning documents (such as Complete Streets Plan, Sidewalk Plan, Plan of Conservation & Development, etc.) that address bicyclists, pedestrian or transit user conditions within or proximate to the project limits? (Can usually be found on applicable website) Contact the RPO Coordination or Intermodal Planning units in the Bureau of Policy and Planning if assistance is needed.	Yes ☑ No ☐	The stretch of Lantern Hill Road that this bridge is located on is on a Southeastern Connecticut Regional Bike & Pedestrian Plan recommended bike route. See Attachment Page Addressing Section F, which shows the map.

SECTION 3: NON-MOTORIZED AND TRANSIT ACCOMMODATIONS

Identify any non-motorized and/or transit user accommodations/improvements that may be considered as part of this project. This section is provided as a list of countermeasures that may be appropriate and is not intended to dictate what features should be included in the project design. **[For State/District-wide or Division of Traffic Engineering projects with many locations answer this section by considering all sites as if they were one location]**

3.1 Pedestrian Facilities and Crossing Treatments		*3.2 Bike Facilities (Cont.)*	
a. New sidewalks	Yes ☑ N/A ☐	e. Signage and/or pavement markings	Yes ☑ N/A ☐
b. Pedestrian median crossing island	Yes ☐ N/A ☑	f. Bicycle parking, bike racks/lockers	Yes ☐ N/A ☑
c. Curb extension/bulb-outs	Yes ☐ N/A ☑	g. Trail Improvements, including parking	Yes ☐ N/A ☑
d. Reduced Corner Radius	Yes ☐ N/A ☑	h. Special height railings	Yes ☐ N/A ☑
e. Pedestrian bridge/tunnel	Yes ☐ N/A ☑	*3.3 Bike & Pedestrian Treatments*	
f. New or relocated unsignalized or mid-block crossing	Yes ☐ N/A ☑	a. Road diet	Yes ☐ N/A ☑
g. Enhanced illumination at pedestrian crossings	Yes ☐ N/A ☑	b. Narrowing travel lane width	Yes ☐ N/A ☑
h. Pedestrian signing and yield lines	Yes ☐ N/A ☑	c. Corridor-wide speed calming	Yes ☐ N/A ☑
i. Parking restrictions near crossings	Yes ☐ N/A ☑	*3.4 Transit Facilities*	
j. Pedestrian hybrid beacon [PHB; also known as the High intensity Activated crossWalK (HAWK)]	Yes ☐ N/A ☑	a. New or revised bus stops	Yes ☐ N/A ☑
		b. Bus shelters	Yes ☐ N/A ☑
k. Rectangular rapid flashing beacon (RRFB)	Yes ☐ N/A ☑	c. Standing pads	Yes ☐ N/A ☑
l. Pedestrian fencing on bridges	Yes ☐ N/A ☑	d. New or revised crossing for bus stop	Yes ☐ N/A ☑
		3.5 Streetscape Elements	
3.2 Bike Facilities		a. Landscaping, street trees, planters, buffer strips, etc.	Yes ☐ N/A ☑
a. Dedicated bike lane or cycle track	Yes ☑ N/A ☐	b. Decorative lighting	Yes ☐ N/A ☑
b. Shared-used lanes	Yes ☐ N/A ☑	c. Public seating or benches	Yes ☐ N/A ☑
c. Shared-used path	Yes ☐ N/A ☑	*3.6 Other (please specify):*	
d. Wider shoulders	Yes ☐ N/A ☑		

Once completed this form should be signed, attached to the Preliminary Design Statement, and filed with the project documents in ProjectWise. If the answer to the question under Section 1 "Applicability" is "Yes", please email the link to the completed form in ProjectWise (or a PDF copy) to: CTDOT.BikePedReviews@ct.gov. Comments will be provided if necessary however, designers are not required to obtain concurrence to move forward with design. This form will be maintained and periodically updated by the Office of Strategic Planning & Projects in the Bureau of Policy & Planning.

Prepared By: John Henault, P.E.

Project Engineer - Print Name

John W. Henault

Digitally signed by John W. Henault
DN: C=US, E=jhenault@wmcengineers.com, O=WMC Consulting Eingineers, CN=John W. Henault
Reason: I am the author of this document
Date: 2025.12.19 08:52:14-05'00'

Signature

Date: 12/19/2025

Approved By: Keegan Elder, P.E.

Project Manager - Print Name

Keegan Elder

Digitally signed by Keegan Elder
DN: C=US, E=kelder@wmcengineers.com, O=WMC Consulting Engineers, CN=Keegan Elder
Date: 2025.12.19 08:36:08-05'00'

Signature

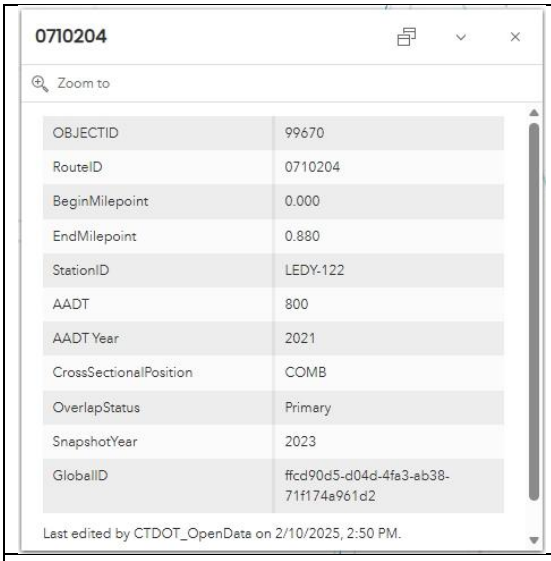
Date 12/19/2025

6. LOTCIP Application Section G – Traffic

Attachment Page Addressing Section G

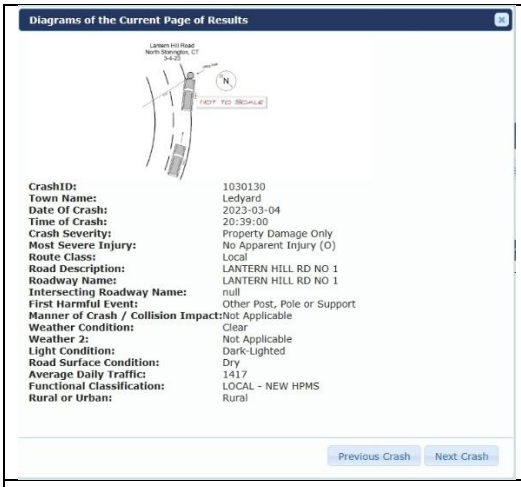
(G) Traffic

1. Volumes – in 2021, there were 800 vehicles per day. According to LOTCIP Guidelines for Preliminary Engineering/Preliminary Design, the 20-year projected ADT is
    - 800 vpd + [800 vpd * (20 years + 4 years) * 1%/Year] = 992 vpd.



From CTDOT_OpenData

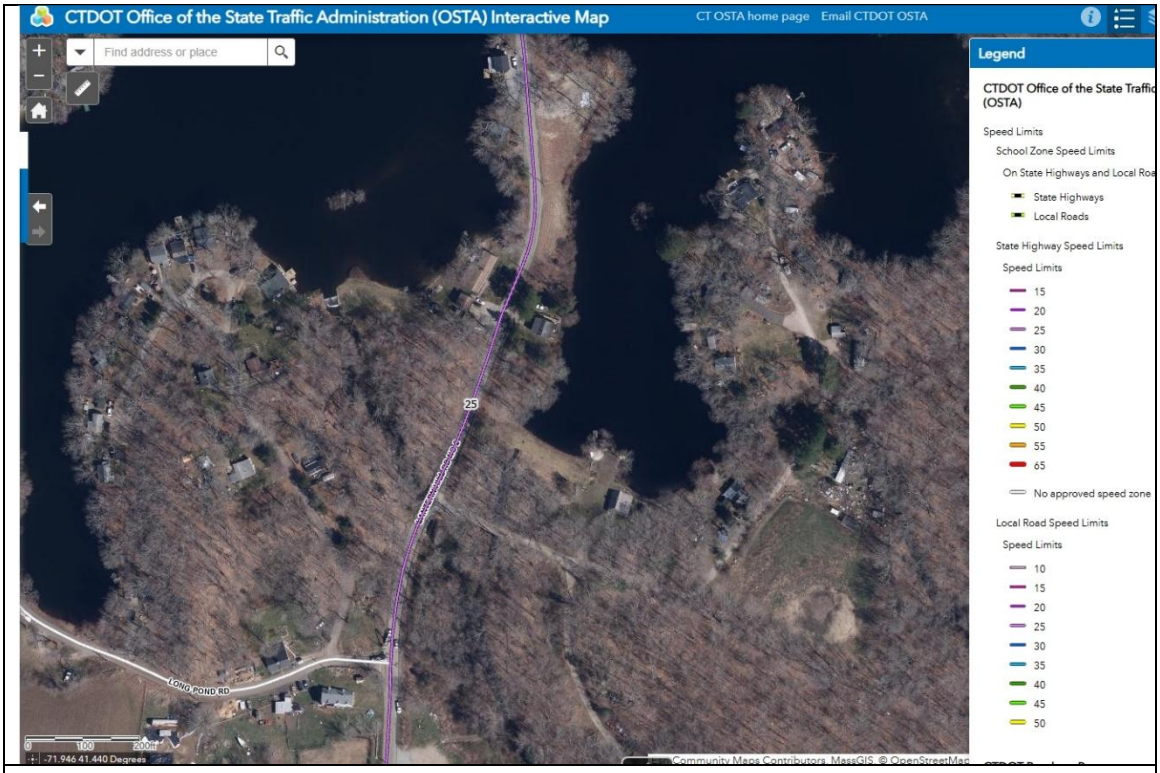
2. Crash Experience – The 3-year data showed one crash in the past 3 years (see below), and it was 1.4 miles north of the proposed bridge replacement project. There are no discernable crash patterns at this location.





From Connecticut Crash Data Repository. One crash 1.4 miles north of proposed bridge replacement project.

3. Traffic Signals – there are no traffic signals in this project.
4. Speed Data – the posted speed limit is 25 mph along this stretch of Lantern Hill Road. There are no speed changes proposed for this project. The designer will confirm (during the design phase) that the current speed is appropriate based on any changes to existing conditions.



CTDOT Office of the State Traffic Administration (OSTA) Interactive Map

7. LOTCIP Application Section J – Estimate

Construction Cost Estimate | LOTCIP Application

Rev. 3/22/23

Lantern Hill Road over Whitford Brook (Bridge No. 71009), Ledyard, CT

Major and Minor Contract Items

Item No.	Item	Unit	Quantity	Unit $	Total Cost (LOTCIP)
0202000	Earth Excavation	C.Y.	1555	$ 49.52	$ 77,003.60
0202100	Rock Excavation	C.Y.	80	$ 141.02	$ 11,281.60
0202529	Cut Bituminous Concrete Pavement	L.F.	55	$ 12.99	$ 714.45
0203202	Structure Excavation - Earth	S.Y.	940	$ 54.77	$ 51,483.80
0204151A	Handling Water	L.S.	1	$ 20,000.00	$ 20,000.00
0212000	Subbase	C.Y.	530	$ 74.89	$ 39,691.70
0216000	Pervious Structure Backfill	C.Y.	1000	$ 80.93	$ 80,930.00
0219001	Sedimentation Control System	L.F.	945	$ 7.70	$ 7,276.50
0406170	HMA S1	Ton	325	$ 219.74	$ 71,415.50
0406171	HMA S0.5	Ton	190	$ 268.43	$ 51,001.70
0406173	HMA S0.25	Ton	15	$ 375.07	$ 5,626.05
0406236	Material for Tack Coat	Gal	140	$ 27.09	$ 3,792.60
0503866A	Removal of Existing Culvert (Site No. 1)	L.S.	1	$ 30,000.00	$ 30,000.00
0514217	Prestressed Deck Units (4'-0" X 1'-0")	L.F.	200	$ 390.00	$ 78,000.00
0520036A	Asphaltic Plug Expansion Joint System	C.F.	25	$ 519.88	$ 12,997.00
0521021A	Steel Laminated Elastomeric Bearings	C.I.	4540	$ 2.26	$ 10,260.40
0601062	Footing Concrete	C.Y.	140	$ 903.63	$ 126,508.20
0601064	Abutment and Wall Concrete	C.Y.	125	$ 1,847.13	$ 230,891.25
0601118	Bridge Deck Concrete	C.Y.	20	$ 2,135.71	$ 42,714.20
0601121	Parapet Concrete	L.F.	120	$ 557.35	$ 66,882.00
0601122	Bridge Sidewalk Concrete	C.Y.	2	$ 824.72	$ 1,649.44
0601123	Approach Slab Concrete	C.Y.	45	$ 727.59	$ 32,741.55
0601504	1" Preformed Expansion joint Filler for Bridges	S.F.	240	$ 26.56	$ 6,374.40
0602030	Deformed Steel Bars-Galvanized	Lbs.	44000	$ 2.78	$ 122,320.00
0605100	Ashlar Stone Masonry	S.F.	710	$ 86.00	$ 61,060.00
0706001	Micropiles	Ea.	14	$ 11,125.84	$ 155,761.76
0706002	Verification Test for Micropiles	Ea.	2	$ 35,984.52	$ 71,969.04
0706003	Proof Test for Micropiles	Ea.	2	$ 7,178.11	$ 14,356.22
0706004	Micropile Length Adjustment	L.F.	105	$ 136.30	$ 14,311.50
0707009A	Membrane Waterproofing (Cold Liquid Elastomeric)	S.Y.	180	$ 149.17	$ 26,850.60
0708001	Dampproofing	S.Y.	160	$ 27.16	$ 4,345.60
0819002A	Penetrating Sealer Protective Compound	S.Y.	110	$ 28.20	$ 3,102.00
0822100.01	Temporary Traffic Barrier	L.F.	80	$ 80.60	$ 6,448.00
0910173	R-B 350 Bridge Attachment - Vertical Shaped Parapet	Ea.	4	$ 5,000.00	$ 20,000.00
0910300	Metal Beam Rail (R-B MASH)	L.F.	100	$ 41.03	$ 4,103.00
0911924	R-B End Anchorage - Type II	Ea.	4	$ 2,284.42	$ 9,137.68
0912503	Remove Metal Beam Rail	L.F.	105	$ 7.95	$ 834.75
0921001	Concrete Sidewalk	S.F.	2100	$ 31.12	$ 65,352.00
0944000	Furnishing and Placing Topsoil	S.Y.	940	$ 16.36	$ 15,378.40
0950005	Turf Establishment	S.Y.	940	$ 5.42	$ 5,094.80
0969060A	Construction Field Office (Small)	Mo.	9	$ 4,210.94	$ 37,898.46
0970006	Trafficperson (Municipal Police Officer (Estimated Cost)	Est.	1	$ 3,500.00	$ 3,500.00
0970007	Trafficperson (Uniformed Flagger)	Hr	40	$ 118.79	$ 4,751.60
0974001	Removal of Existing Masonry	C.Y.	170	$ 364.34	$ 61,937.80
0976002	Barricade Warning Light-High Intersity	Day	1620	$ 1.05	$ 1,701.00
0977001	Traffic Cone	Ea.	25	$ 22.38	$ 559.50
0979003	Construction Barricade Type III	Ea.	4	$ 181.05	$ 724.20
1208931A	Sign Face - Sheet Aluminum (Type IX Retroreflective Sheeting)	S.F.	5	$ 104.04	$ 520.20
1210102	4" Yellow Epoxy Resin Pavement Markings	L.F.	895	$ 1.29	$ 1,154.55
1220027	Construction Signs	S.F.	325	$ 23.72	$ 7,709.00

A	**Major Items Subtotal**				**$ 1,780,118**
B	**Minor Items Subtotal**	25	% of Line "A"		**$ 445,029**
C	**Major and Minor Contract Items Subtotal (A + B)**				**$ 2,225,147**

Other Item Allowances

Clearing and Grubbing	2	% of Line "C"	$ 44,503
M & P of Traffic	3	% of Line "C"	$ 66,754
Mobilization	6.5	% of Line "C"	$ 144,635
Construction Staking	1	% of Line "C"	$ 22,251
D Other Items Subtotal			**$ 278,143**
E CONTRACT SUBTOTAL (C + D)			**$ 2,503,290**

Inflation Costs (Simple Method)

Date of Estimate	Nov-25	
Anticipated Bid Date	Apr-27	
Annual Inflation	5.0%	*0% if bid date is < 1yr in the future, per DOT estimating guidelines

F	**Inflation Subtotal**	7.0%	of Line "E"	**$ 175,230**
G	**TOTAL CONTRACT COST ESTIMATE (E + F)** (Rounded to nearest $1000)			**$ 2,679,000**

LOTCIP Project Costs Summary		
Contract Cost Estimate (Line "G")		$ 2,679,000
Contingencies (10% per LOTCIP Guidelines)	10%	$ 267,900
Incidentals (10% per LOTCIP Guidelines)	10%	$ 267,900
ROW	LS	$ 10,000
Relocations conducted by Utility forces (non-contract items)	LS	N/A
TOTAL PROJECT COST		**$ 3,224,800**

8. LOTCIP Application Section K – Roadway Geometric Improvements

(K) Roadway Geometry Improvements
There is no speed change. Proposed geometric improvements involve widening the roadway to 27 feet within the project limits (see Typical Roadway Section Lantern Hill in Section A-4, Project Concept Level Plans). There are no other proposed geometric improvements. The designer will confirm (during the design phase) that the current speed is appropriate based on the geometric changes.

9. LOTCIP Application Section M – Latest Bridge Inspection Report

TOWN OF LEDYARD

INSPECTION
of
LANTERN HILL ROAD
over
WHITFORD BROOK
Bridge No. 71009

Prepared For:

THE TOWN OF LEDYARD

DEPARTMENT OF PUBLIC WORKS
741 COLONEL LEDYARD Hwy
LEDYARD, CONNECTICUT

May 2024

Prepared by:
Wengell, McDonnell & Costello
-Consulting Engineers-
87 Holmes Road
Newington, Connecticut 06111



TABLE OF CONTENTS

Page

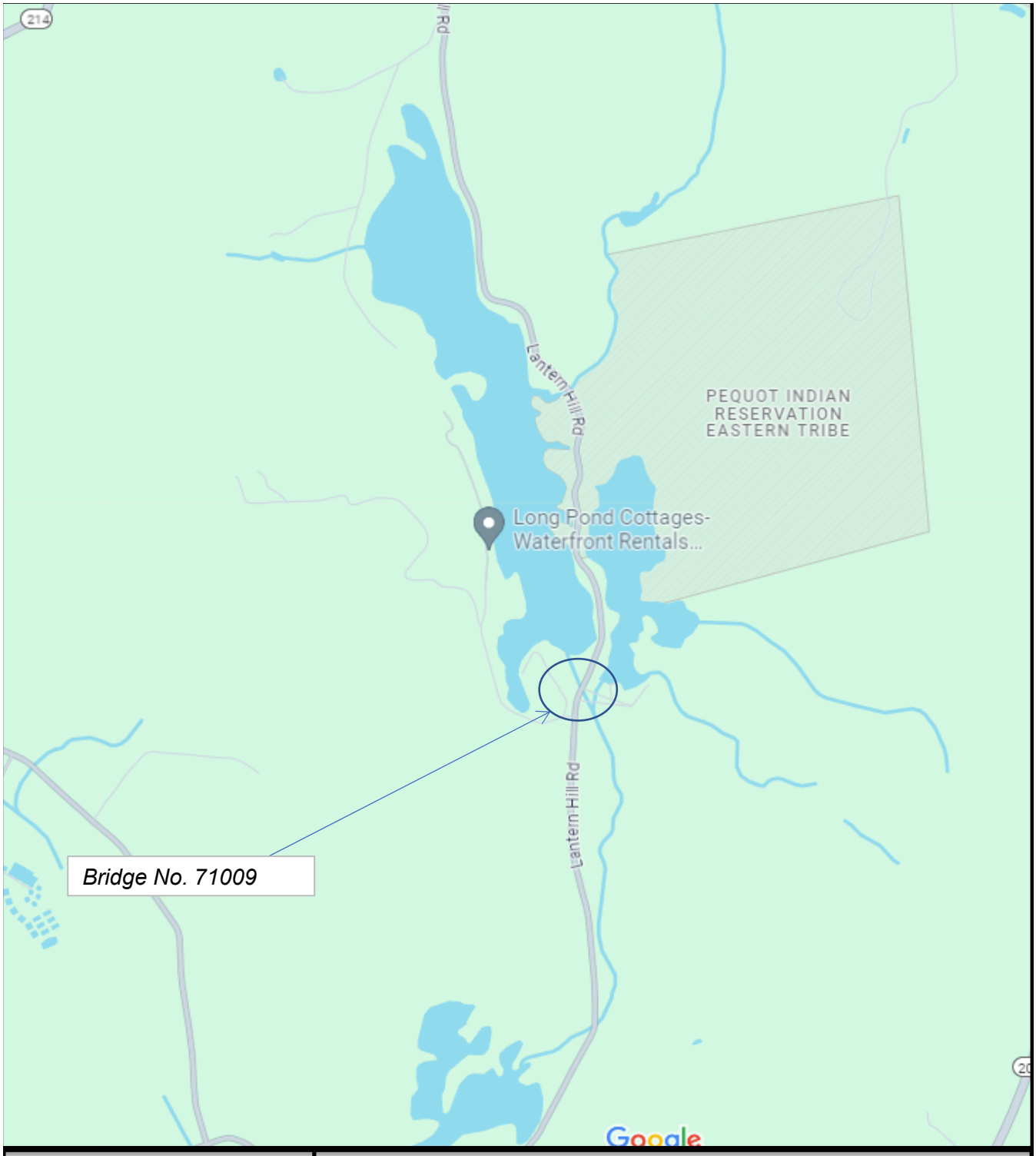
LOCATION MAP

EXECUTIVE SUMMARY

GENERAL	**1**
OVERVIEW	**1**
RECOMMENDATION	**2**

APPENDICES

Appendix A – BRI-19 Bridge Inspection Form	**A1 – A4**
Appendix B – BRI-18 Bridge Inspection Form	**B1 – B5**
Appendix C – Photographs	**C1 – C7**



WMC
CONSULTING ENGINEERS

Wengell, McDonnell & Costello
-Consulting Engineers-
87 Holmes Road
Newington, Connecticut 0611

THE TOWN OF LEDYARD

LANTERN HILL ROAD
Over
WHITFORD BROOK
Bridge No. 71009
Location Map

Bridge No. 71009
Lantern Hill Road over Whitford Brook
Ledyard, CT

EXECUTIVE SUMMARY

GENERAL

Bridge No. 71009 carries Lantern Hill Bridge over the Whitford Brook located in the Town of Ledyard, CT. The bridge consists of two asphaltic coated corrugated metal pipes 5-ft in diameter. The headwalls and wingwalls are constructed of stone masonry. The bridge carries one lane of traffic in each direction with an overall curb-to-curb width of approximate 24-feet. There is metal beam rail on both sides of the bridge with no sidewalks.

WMC Consulting Engineers (WMC) performed the inspection of the bridge on May 18, 2024. The inspection included the visual evaluation of all bridge members and the channel through the structure, as well as just upstream and downstream of the bridge. The bridge was found to be in Poor Condition (Condition Rating = 4) overall.

OVERVIEW

The bituminous concrete overlay is in Fair Condition (Condition Rating = 5). The overlay exhibits moderate mapped cracking and transverse cracks at the bridge and its approaches. There is metal beam rail on the bridge and its approaches. The metal beam rail was found to be in fair condition. The rail exhibits signs of some collision damage at isolated locations.

The two asphaltic coated corrugated metal pipes are in Poor Condition (Condition Rating = 4) overall. The pipes exhibit some surface rust at the water level. The pipe has been damaged due to what appears to be metal beam rail post driven through the top cord of the pipe on the upstream west pipe and is the primary source of a Poor Conditions ratings. The pipes are otherwise is satisfactory condition throughout. The stone masonry head walls are in fair condition with some moderate joint section loss.

The stone masonry wingwall are in Poor Condition (Condition Rating = 4) overall. All four wingwalls exhibits missing stones that have fallen into the brook. There is also some minor joint section loss at isolated locations.

The Channel & Channel Protection is in Fair Condition (Condition Rating = 5) overall. There is no debris or water turbulence noted around the substructure elements. There is some local scour just upstream and downstream of the bridge.

The bridge approaches are in Satisfactory Condition (Condition Rating =8) overall. There is a no reduction of operating speed at the bridge.

RECOMMENDATIONS

Replace existing bridge

APPENDIX A
Form BRI-19

WMC
CONSULTING ENGINEERS

Bridge No. 71009

Form: BRI-19, Rev. 4/20
Inspection Type: Routine
Inspection Date: 05/18/2024
Inspected By: Emanuel Duarte

STRUCTURE INVENTORY & APPRAISAL

INSPECTION

Priority Rating:	55.26	**Functionally Obsolete**	
Sufficiency Rating	56.37%		
(90) Inspection Date	5/18/2024	**(91) Frequency**	
Indepth Insp.	No.	**Proposed next Indepth Year**	
Deck Survey Date		**Class**	
Access		**Flagman**	

	Frequency	Date	Type
Fracture			
Underwater			
Special			

IDENTIFICATION

Bridge Name	71009
Town Code - Name	42600 - LEDYARD
(5) Inventory Route	
(A) Record Type	
(B) Signing Prefix	
(C) Level of Service	
(D) Dir. Suffix	
(6A) Feature Intersected	WHITFORD BROOK
(6B) Critical Facility Indicator	
(7) Facility Carried	LANTERN HILL ROAD
(9) Location	300 FT N OF LONG POND RD
(11) Mile Post	1 Miles
(16) Latitude	41 Deg. 926 Min. 16.08 Sec.
(17) Longitude	-71 Deg. 56 Min. 38.18 Sec.
(98) Border Bridge	
(A) State Code	000
(B) Percent Responsibility	00 %
(C) Border Town Name	
(99) Border Bridge Structure No.	

STRUCTURE TYPE & MATERIALS

(43) Structure Type, Main	
(A) Material	3 - Steel
(B) Design Type	19 - Culvert
(44) Structure Type, Approach	
(A) Material	0 - Not Applicable
(B) Design Type	00 - Not Applicable
(45) Number of Spans, Main Unit	1
(46) Number of Approach Spans	0
(107) Deck Structure Type	N - Not Applicable
(108) Wearing Surface/ Protection Systems	
(A) Type of Wearing Surface	6 - Bituminous
(B) Type of Membrane	8 - Unknown
(C) Type of Deck Protection	8 - Unknown
Substructure	
(A) Material	N - Not Applicable
(B) Design Type	
Paint	
Type	
Year	
Comment	

GEOMETRIC DATA

(48) Length of Maximum Span	5		ft.
(49) Structure Length	14.5		ft.
(50) Curb or Sidewalk Widths			
(A) Left			in.
(B) Right			in.
(51) Bridge Roadway Width, Curb to Curb	24	0	ft. / in.
(52) Deck Width, Out to Out	27		ft. / in.
(32) Approach Roadway Width	24		ft.

WMC CONSULTING ENGINEERS

Bridge No. 71009

Form: BRI-19, Rev. 4/20
Inspection Type: Routine
Inspection Date: 05/18/2024
Inspected By: Emanuel Duarte

(33) Bridge Median	0 - No Median				
Deck Area	392	sq. ft.			
(34) Skew Angle	51	Deg.			
(35) Structure Flared	0 - No Flare				
(10) Inv. Rte. Min. Vertical Clearance			99 ft.	99 in.	
(47) Inv. Rte. Horizontal Clearance			99 ft.	99 in.	
Log Inv. Rte. Total Horizontal Clearance			ft.	in.	
Rlog Inv. Rte. Total Horizontal Clearance			ft.	in.	
(53) Min. Vert. Clearance Over Bridge			99 ft.	99 in.	
(54) Log-Min. Vert. Underclearance	N	ref.	00 ft.	00 in.	
(55) Min. Lat. Underclearance on Right	N	ref.	00 ft.	00 in.	
(56) Min. Lat. Underclearance on Left			ft.	in.	

AGE AND SERVICE

Year Built	1950		
(106) Year Reconstructed			
(42) Type of Service			
(A) On	1 - Highway		
(B) Under	5 - Waterway		
(28) Number of Lanes			
(A) On	2	(B) Under	0
(29) Average Daily Traffic	600		
Is Above Half ADT?			
(109) Percent Truck		%	
(30) Years of ADT	1991		
(19) Bypass, Detour Length	7.4	Miles	

CONDITION

(58) Deck	N	By:	EOD
(59) Superstructure	N	By:	EOD
(60) Substructure	N	By:	EOD
(61) Channel & Channel Protections	5	By:	EOD
(62) Culverts	4	By:	EOD
(36) Traffic Safety Features			
(A) Bridge Railings	0	By:	EOD
(B) Tranisitions	0	By:	EOD
(C) Approach Guiderail	0	By:	EOD
(D) Approach Guiderail Ends	0	By:	EOD

APPRAISALS

(67) Structural Evaluation	4	By:	EOD
(68) Deck Geometry	4	By:	EOD
(69) Underclearances, Vert. & Horiz.	N	By:	EOD
(71) Waterway Adequacy	5	By:	EOD
(72) Approach Roadway Alignment	8	By:	EOD
(113) Scour Critical	6	By:	EOD

COMMENTS

Year Built: Assumed based on bridge number 101008, 101009, 137001, were all build on the same year, on lantern hill road.
ADT based on bridge 137001, on lantern hill road, worst case

WATERWAY

Drainage Basin Waterway			
(38) Navigation Control	0 - No navigation control		
(39) Navigation Vertical Clearance	000 ft.		
(40) Navigation Horizontal Clearance	0000 ft.		
(111) Pier/Abutment Protection			
(116) Vertical-Lift Brg. Nav. Min.		ft.	in.
(103) Temporary Structure			
(110) Designated National Network	0 - Not part of national network for trucks		
(20) Toll	3 - Free Road		
(21) Maintain	3 - Town or Township Hwy. Agency		
(22) Owner	3 - Town or Township Hwy. Agency		

CLASSIFICATION

(112) NBIS Bridge Length	N - No
(104) Highway System	0 - Not on NHS
(26) Functional Class	09- Rural Local
(100) Defense Highway	0 - Not a STRAHNET route
(101) Parallel Structure	N - No parallel structure
(102) Direction of Traffic	2 - 2-way traffic

WMC
CONSULTING ENGINEERS

Bridge No. 71009

Form: BRI-19, Rev. 4/20
Inspection Type: Routine
Inspection Date: 05/18/2024
Inspected By: Emanuel Duarte

Report Class	
(37) Historical Significance	

POSTED SIGNS

Other Posted Sign 1	N
Other Posted Sign 2	N

	Actual	Recommended	
Posted Load Single Unit Truck			tons
Posted Load Semi-Trailer Truck			tons
Posted Load 4-Axle Truck			tons
Posted Load 3S2 Truck			tons
All Vehicles			tons

Posted Vertical Clearance on Bridge	N	ft.		in.
Posted Vertical Underclearace	N	ft.		in.
Posted Speed Limit on Bridge	25	m.p.h.		

OTHER FEATURES

Fence Required	
Fence Present	
Fence Type	
Fence Height	
Fence Material	
Fence Top Type	
Barrel Ladders	
Stand Pipes	
Catwalks	
Moveable Inspection System	
Haunches Present over Roadway	
Utilities	

PROPOSED IMPROVEMENTS

(75A) Type of Work Proposed	
(75B) Work Done By	
(76) Length of Structure Improvement	ft.
(94) Bridge Improvement Cost	$
(95) Roadway Improvement Cost	$
(96) Total Project Cost	$
(97) Year of Improvement Estimate	
(114) Future ADT	
(115) Year of Future ADT	
DOT Bridge Program List No.	
Project No.	
Advertise Date	

LOAD RATING & POSTING

(31) Design Load	8 - Unknown
(63) Operating Rating Type	5- No Rating Analysis Performed
(64) Operating Rating	
(65) Inventory Rating Type	5- No Rating Analysis Performed
(66) Inventory Rating	
Evaluation Code	J - Judgement Rating
Year of Evaluation	
(70) Bridge Posting	
(41) Structure Status	A - Open, no restriction

INSPECTOR'S SIGNATURES:

1) Date:

2) Date: 5/22/2024

3) Date:

4) Date:

P.E. Signature: Keegan O. Elder Date: 05/23/24

P.E. # 31602

Reviewed By: Date:

APPENDIX B
Form BRI-18

Connecticut Department of Transportation
Bridge Inspection Report BRI-18

BRIDGE #: 71009 **INSPECTION DATE:** 05/18/24

INSPECTION TYPE:	ROUTINE	**PREVIOUS INSPECTION DATE:**		**SNOOPER REQUIRED:**	No
INSPECTION PERFORMED BY:	WMC ENGINEERS			**SNOOPER USED:**	No

TOWN:	42600 - LEDYARD	**FEATURE CARRIED:**	LANTERN HILL ROAD	**YEAR BUILT:**	1950
LOCATION:	300 FT N OF LONG POND RD	**FEATURE INTERSECTED:**	WHITFORD BROOK	**YEAR REBUILT:**	
MAIN MATERIAL:	Steel	**MAIN DESIGN:**	19 - Culvert		

INSPECTION VISITS:

				INSPECTORS:			
Inspection Date:	5/18/2024	Start Time:	11:00 AM	Inspector:	E.O.D.	Task:	
Temperature	45°F	End Time:	11:40 PM	Inspector:		Task:	
				Inspector:		Task:	

58. DECK **OVERALL RATING** **N**

	RATING	
OVERLAY	5	The Bituminous concrete overlay exhibits moderate mapped cracking and transverse cracks at the bridge and its approaches. There are isolated there the overlay had be patched.
DECK STR. CONDITION	N	
CURBS	N	
MEDIAN	N	
SIDEWALKS	N	
PARAPET	N	N
RAILING	5	There is metal beam rail on the bridge and its approaches. The metal beam rail was found to be in fair condition. The rail exhibits signs of some collision damage at on the southeast bridge approach.
PAINT		
FENCE		
DRAINS		
LIGHTING STANDARD		
UTILITIES TYPE/SIZE		
CONSTRUCTION JOINTS		
EXPANSION JOINTS		

Connecticut Department of Transportation
Bridge Inspection Report BRI-18

59. SUPERSTRUCTURE			OVERALL RATING	N
	RATING			
BEARING DEVICES	N			
STRINGERS	N			
GIRDERS	N			
FLOOR BEAMS	N			
TRUSSES-GENERAL	N			
TRUSSES-PORTALS	N			
TRUSSES-BRACING	N			
PAINT	N			
RUST	N			
MACHINERY MOV SPAN	N			

BRIDGE #: **71009** **INSPECTION DATE:** 5/18/2024

RIVETS & BOLTS		
WELDS & CRACKS		
TIMBER DECAY		
CONCRETE CRACKING		
COLLISION DAMAGE		
MEMBER ALIGNMENT		
DEFLECT. UNDER LOAD		
VIBR. UNDER LOAD		
STAND PIPES		
BARREL LADDERS		

ARE BARREL LADDERS OSHA COMPLIANT?

Connecticut Department of Transportation
Bridge Inspection Report BRI-18

60. SUBSTRUCTURE	RATING		OVERALL RATING: N
ABUTMENTS-STEM	N		
ABUTMENTS-BACKWALL	N		
ABUTMENTS-FOOTINGS	N		
ABUT.-SETTLEMENT	N		
ABUTMENTS-WINGWALLS	N		
PIERS/BENTS-CAPS			
PIERS/BENTS-PILE BENT			
PIERS/BENTS-COLUMN			
PIERS/BENTS-FOOTINGS			
PIERS/BENTS-SETTLEMENT			
EROSION-SCOUR			
CONCRETE CRACK-SPALL			
STEEL CORROSION			
PAINT			
TIMBER DECAY			
COLLISION DAMAGE			
DEBRIS			

61. CHANNEL PROTECTION	RATING		OVERALL RATING: 5
CHANNEL SCOUR	5	There is some local scour just upstream and downstream of the bridge at the inverts.	
EMBANKMENT EROSION	6	moderate vegetation growth at the embankments	
DEBRIS			
VEGETATION			
CHANNEL CHANGE			

BRIDGE #: 71009 **INSPECTION DATE:** 5/18/2024

FENDER SYSTEM		
SPUR DIKES & JETTIES		
RIP RAP		

Connecticut Department of Transportation
Bridge Inspection Report BRI-18

62. CULVERTS & RETAINING WALL | Asphaltic coated corrugated metal pipes | **OVERALL RATING** 4

	RATING	
BARREL	4	The pipes exhibit some surface rust at the water level. The pipe has been damaged due to what appears to be metal beam rail post driven through the top cord of the pipe on the upstream west pipe and is the primary source of a Poor Conditions ratings. There is some material that is eroding at the damaged pipe location. There are some minor stones missing between the two culverts and at isolated location between the culvert at the stone masonry wingwalls. The pipes are otherwise is satisfactory condition throughout.
CONCRETE		
STEEL		
TIMBER		
HEADWALL	5	The stone masonry head walls are in fair condition with some moderate joint section loss.
CUTOFF WALL		
DEBRIS		
RETAINING WALL STEM	4	The stone masonry wingwall are in Poor Condition (Condition Rating = 4) overall. All four wingwalls exhibits missing stones that have fallen into the brook. There is also some minor joint section loss.
FOOTING		

APPROACH CONDITION | **OVERALL RATING** 8

	RATING	
APPROACH SLAB		
RELIEF JOINTS		
APPROACH GUIDE RAIL		
APPROACH PAVEMENT		
APPROACH EMBANKMENT		

TRAFFIC SAFETY FEATURES:

BRIDGE RAILINGS	0	Does not meet Current Standards
TRANSITIONS	0	Does not meet Current Standards
APPROACH GUARDRAILS	1	Does meet Current Standards
APPR. GUARDRAIL ENDS	0	Does not meet Current Standards

LOAD POSTING

SINGLE UNIT (TONS)	N	
HS (TONS)	N	
4 AXLE (TONS)	N	
2S3 (TONS)	N	
ADVANCE WARNING Y/N	N	
LEGIBILITY	N	
VISIBILITY/LOCATION	N	

BRIDGE #: 71009 **INSPECTION DATE:** 5/18/2024

Connecticut Department of Transportation
Bridge Inspection Report BRI-18

MISC.

MIN VERT. UNDERCLR.	' "	
POSTED CLR UNDER BRIDGE	' "	
POSTED CLR UNIT (TONS)	' "	
ADVANCE WARNING (Y/N)	N	
SPEED LIMIT (IF ANY)	25 MPH	Posted
CHARACTER OF TRAFFIC		light

ADDITIONAL NOTES

ADDITIONAL COMMENTS:

Inspectors' Signatures:

1) _____ DATE: 5/22/2024

2) _____ DATE: __/__/__

3) _____ DATE: __/__/__

4) _____ DATE: __/__/__

P.E. Signature: Keegan O. Ebbs DATE: 05/23/24

P.E. #: 31602

Reviewed by: _____ CDOT DATE: __/__/__

APPENDIX D
Photographs



1. Roadway Looking East



2. Roadway Look West



3. Upstream Bridge Elevation View



4. Downstream Bridge Elevation View



5. Upstream Channel



6. Downstream Channel



7. Typical Metal Beam Rail over Culvert



8. Damaged Metal Beam Rail



9. Inside East Pipe



10. Inside West Pipe



11. Upstream West Pipe Damage



12. Typical Headwall Joint Section Loss



13. Typical Wingwall Missing Stone (All four Wingwalls)



14. Culvert-Wingwall Interface Damage

10. LOTCIP Application Section O – Pavement Structure Improvement

General Information	
Project Number	TBD
Project Description	Lantern Hill Road over Whitford Brook (Bridge 71009)
Town(s)	Ledyard
Pavement Scope Description	Reconstruction
Completed By	Henault
Reviewed By	Henault
Company Name	WMC Consulting Engineers
Road Name	Lantern Hill Road
Pavement Surface Age	Reconstruction

Legend	
	= automatically calculated or linked value (do not edit)
	= user input
	= solution(s)
	= accumulated ESALs for the designated functional class
	= not applicable

Step		Value	Unit	Variable Definition	Commentary	User Notes	AASHTO93 Reference (or Other)
Step 1: Available ADT		800	vpd (vehicles per day)	Available ADT (Average Daily Traffic) is the measured total volume of vehicle traffic on the subject roadway in *both directions*. The top link, below, contains an interactive AADT map for all roadways in CT that can be used to locate traffic data. The bottom link contains expressway ADT maps for limited access facilities as well as ADT maps for towns. https://portal.ct.gov/DOT/PP_SysInfo/Traffic-Monitoring https://portal.ct.gov/DOT/PP_Bureau/Documents/Maps	**Double click to expand notes:** • Please note that ADT is general measure of mean daily traffic and may represent a short-term traffic study (i.e. 3-day or 7-day count) while AADT (Average Annual Daily Traffic) represents data for the entire year. Both values are acceptable for use in this calculator; however, it should be recognized that AADT may provide a more precise solution because of a		Appendix D https://www.fhwa.dot.gov/policyinformation/pubs/pl18027_traffic_data_pocket_guide.pdf
Step 2: Year	ADT Year	2021		Year for the available ADT data	The year for the ADT should be from the same source where the ADT value was taken.		N/A
	EOC Year	2027		End of construction (EOC) year for the project	The year for EOC may not always be known or provided. In this case, reach out to the lead design staff for the latest project schedule. For CTDOT projects please refer to the link to Compass below: https://ctgovexec.sharepoint.com/projects/Pages/Projects.aspx		
Step 3: Directional Distribution		50	%	Directional distribution is the percentage of traffic traveling in one direction along the roadway. 50% is the default value for two-way traffic on undivided roadways, or if using combined directional data for a divided highway. Please enter 100% for a one-way road design (ramps, roundabouts, etc.), or if using single direction traffic data for a divided highway (i.e. using northbound data on a N/S expressway).	If there is more specific information available that indicates a directional distribution other than 100% or 50%, then the input should be adjusted accordingly for the design direction.		I-11, 1.4.1
Step 4: Lane Distribution		100	%	Lane distribution is the percentage of traffic that will be carried in the design lane proposed in the *final* project configuration, not the existing lane conditions (check the project final plans and/or coordinate with the designer or traffic engineer if necessary). "Lanes" refers to the through lanes only, not auxiliary lanes (turning, passing, climbing, acceleration/deceleration, etc.)	Lane distribution varies by the number of through lanes, and values lower than 100% may be used for the lane distribution (see chart below). Please use the CTDOT lane distribution values unless noted otherwise.		I-11, 1.4.1 I-9, 2.1.2, Table 2.2

	Percent of ESALs in Design Lane	
Number of Lanes	**CTDOT**	**AASHTO**
2 lanes (1 per direction)	100%	100%
4 lanes (2 per direction)	90%	80-100%
6+ lanes (3+ per direction)	70%	50-80%

Step 5: Design ADT		450	vpd (vehicles per day)	Design ADT is a calculated value that will be used to determine the accumulated ESALs in the design lane	The Design ADT value is calculated by using a default 2% growth rate from the year of the provided ADT to EOC. Typical practice is to project from the ADT year to EOC and use that number as the initial value for the start of the pavement structure's design life.		Appendix D
Step 6: Growth Rates		2.0	% (cars)	Annual growth rate of cars over the design period	Please use a default growth rate of 2% for cars and heavy vehicles unless another value is specifically provided or researched.		I-11, 1.4.1 Appendix D
		2.0	% (trucks)	Annual growth rate of all heavy vehicle types over the design period			
Step 7: Design Life		20	years	Period of time for which the pavement design/analysis is to be conducted	**Double click to expand notes:** • 20 year design life is standard for state roadway design and should be the default value. It can also be used for most town roads and highway ramps. 15 year design life may be used for town roads as well depending on the program and treatment proposed.		I-43 to I-47, 3.4.2 to 3.6.7 II-6 to II-7, 2.1.1 https://pavementinteractive.org/reference-desk/design/structural-design/perpetual-pavements/
Step 8: Roadway Functional Class		Rural Major Collector	*(please click green cell and then choose drop down selection)*	A roadway functional class (FC) is the designation of a roadway into systems according to the character of service it provides in relation to the total roadway network. Please note that in this case the "Multi-lane" class is equivalent to an interstate highway. The link below is an interactive GIS map which includes the FC of the roadways in Connecticut: https://connecticut-ctdot.opendata.arcgis.com/apps/functional-classification-interactive-app/explore	After determining the roadway FC, the ESAL value will be calculated automatically using the appropriate vehicle distributions. The result will be displayed in green in Step 8 corresponding to a Rural or Urban functional class. The red cell labeled "FALSE" is not applicable.		https://www.fhwa.dot.gov/planning/processes/statewide/related/highway_functional_classifications/fcauab.pdf

General Information	
Project Number	TBD
Project Description	Lantern Hill Road over Whitford Brook (Bridge 71009)
Town(s)	Ledyard
Pavement Scope Description	Full Depth Reconstruction (20-year)
Completed By	Henault
Reviewed By	Henault
Company Name	WMC Consulting Engineers
Road Name	Lantern Hill Road
Pavement Surface Age	Reconstruction

Legend	
	= automatically calculated/linked value (do not edit)
	= user input
	= solution(s)
	= solved target cell/adequate pavement structure
	= unsolved target cell/inadequate pavement structure

Step	Parameter	Variable	Value	Unit	Variable Definition	Commentary	User Notes	AASHTO93 Reference (or Other)	
Step 1: General Information	Initial Serviceability	Po	4.2		Initial design serviceability index	Default value for flexible pavements		I-6 to I-9, 1.2 to 1.3 II-10 to II-11, 2.2.1	II-31 and II-34, 3.1.1 to 3.1.3
	Terminal Serviceability	Pt	2.0		Terminal design serviceability index	Use a value of 2.5 for all functional classifications, except collectors (urban/rural, major or minor) and local roads which may use a value of 2.0		I-6 to I-9, 1.2 to 1.3 II-10, 2.2.1	II-31 and II-34, 3.1.1 to 3.1.3
	Change in Present Serviceability Index (PSI)	ΔPSI	2.20		Difference between initial and terminal design serviceability index	Value is calculated automatically		I-6 to I-9, 1.2 to 1.3 II-10 to II-11, 2.2.1	II-31 and II-34, 3.1.1 to 3.1.3
	Reliability Level	R	90	%	Reliability	Use a value of 95% for Interstates/Expressways (limited access), and use 90% for all other lower functional classifications (unlimited access) as defined in the ESAL Calculator		I-60 to I-64, 4.2.3 to 4.5, Table 4.1	II-9, 2.1.3, Table 2.2 II-31 and II-34, 3.1.1 to 3.1.3
	Standard Normal Deviate	ZR	-1.28		Standard normal deviate corresponding to a level of reliability, R	Value is calculated automatically		I-5, 1.2 I-60 to I-64, 4.2.3 to 4.5, Table 4.1	II-8, 2.1.3 II-31, 3.1.1
	Overall Standard Deviation	S	0.45		Combined standard error of the traffic prediction and performance prediction	Default value selected (AASHTO allows 0.40 to 0.50 for flexible pavement design)		I-5, 1.2 II-9, 2.1.3	II-10, 2.2.1
Step 2: Traffic Analysis	Accumulated ESALs	W18	191,272	ESALs	Predicted number of 18-kip equivalent single axle load applications over the design life. The design life is the period of time for which the pavement design/analysis is to be conducted (determined with the ESAL Calculator linked on the previous sheet).	**Double click to expand notes:**		I-5, 1.2 I-10 to I-13, 1.4	I-54 to I-55, 4.1.3 II-31 to II-35, 3.1.1 to 3.1.4
Step 3: Soil Analysis	Subgrade Resilient Modulus	M[r]	8,000	psi	Definitive material property used to characterize roadbed soil for pavement design and is a measure of the elastic property of soil recognizing certain nonlinear characteristics	**Double click for M[r] values:**		I-6, 1.2 and I-13 to I-15, 1.5 II-12 to II-15, 2.3.1	II-31 to II-35, 3.1.1 to 3.1.4 III-91 to III-97, 5.3.4 to 5.4.5

Step 4: Proposed Pavement Structure - Layer Thicknesses	**Layer**	**Coefficient, a[i]**	**Thickness**	**Unit**				
	Surface Mix	0.44	2.00	inch		**Double click to expand notes:** **Thickness:** Please insert the depth of each layer being constructed within the proposed pavement structure in the cells on the left • A minimum total pavement structure depth of 18" - 20" (asphalt and granular base layers combined) is recommended for the purpose of mitigating potential damage from frost action. This is approximately half the frost depth in CT (~ 40"). • For pavement structures with a single mix type, it is recommended to split the depth		II-17 to II-22, 2.3.5 II-35 to II-37, 3.1.4 and 3.1.5 III-95 to III-105, 5.4.5, Table 5.2 MTG Pavement Design Catalog (see for typical pavement structures): https://portal.ct.gov/DOT/Engineering/Pavement-Design/Pavement-Design-Unit	
	Base Mix	0.34	4.00	inch					
	Processed Aggregate Base (P.A.B.)	0.14	0.00	inch					
	Subbase	0.11	14.00	inch					
	Total Pavement Structure Thickness:		20.00	inch					
Step 5: Solve Design Equation	Target Cell		0.00		Solved target cell = Unsolved target cell =	Please ***solve*** the target cell by clicking on the "Data" tab > under the "Analyze" category > click "Solver" and then click "Solve" in order to determine the pavement structure adequacy. The cell should be green and read "0.00" when successfully solved. If values have been changed, the cell will turn red and should be solved again.		If the "Solver" Add-in is not loaded in Excel, please use the link below: https://support.microsoft.com/en-us/office/load-the-solver-add-in-in-excel	
Step 6: Pavement Structure Adequacy	Provided Structural Number (SN)		3.78		The Provided SN expresses the predicted structural strength of the roadway provided by the proposed pavement structure	This value is calculated by multiplying each pavement layer's thickness by the corresponding layer coefficient. The Provided SN is the sum of these values.		I-6, 1.2 III-95 to III-96	III-101, 5.4.5
	Required Structural Number (SN)		2.52		The Required SN represents the structural number required to carry the future traffic according to inputs such as accumulated ESALs, subgrade resilient modulus, etc.	This value is calculated automatically after Step 5		II-31 to II-32 III-95 to III-96	III-101, 5.4.5
	Difference between provided and required SN		1.26		This value represents the difference between the SN provided by the pavement design and the SN required for all future traffic on the pavement structure	A suggested factor of safety for this value is approximately 0.5. The larger this value, the more conservative the design.			
	Adequate?		Yes		If the pavement structure is adequate given the design life, the output is "Yes". If it is not adequate, the output is "No".	If the output reads "Invalid", please refer to Step 5 and solve the Target Cell as instructed			

PRELIMINARY PAVEMENT EVALUATION FORM FOR LOCAL ROADS PROGRAMS

General Information

Consultant Firm: WMC Consulting Engineers

Completed By: John Henault

Reviewed By: Keegan Elder

Project Description: Lantern Hill Rd over Whitford Brook

Road Name: Lantern Hill Road

Start Limit: 200 ft before Bridge No. 71009

End Limit: 200 ft after Bridge No. 71009

Pavement Surface Age: 20+ Years

Multiple Sections? No

For the purposes of this form, a section is defined as a roadway area having the same or similar surface age and exhibiting similar distresses/overall condition. If multiple sections are present, please fill out a separate sheet for each.

Instructions / References

The purpose of this form is to aid engineers in selecting an appropriate treatment category for pavement projects. This form should be both completed and reviewed/approved by an engineer with experience in the field of pavements.

To select the proper treatment category for a given project, the condition of the pavement must first be evaluated through distress identification and characterization. Please refer to the links below for examples and descriptions of common distress types. These distresses can be defined as either "structural" or "functional" in nature, and further defined as "primary" or "secondary" based on how the distress type is contributing to the overall need for roadway repair.

FHWA - Distress Identification Manual

Pavement Interactive - Pavement Distresses

Once distresses have been identified, the table below can be used to determine which treatment category would be most appropriate based on the predominant distress mechanism(s). The surface age of the pavement may also be used as a guide to help select a treatment category but should not be relied upon.

Predominant Distress Mechanism	*Treatment Category*	*Typical Surface Age (years)*
Primarily functional distresses with minimal or no structural distresses	Pavement Preservation	6 to 12
Primarily functional distresses of varying extent and severity with minimal isolated structural distresses	Minor Rehabilitation	10 to 15
Extensive functional distresses with some isolated structural distresses	Major Rehabilitation	15+
Extensive structural failure	Full Depth Reconstruction	20+

Structural Distresses	Distress Type Present? (**Y**es / **N**o)	Severity Level (**L**ow / **M**oderate / **H**igh)	Extent Level (**I**solated / **E**xtensive)	Distress Level (**P**rimary / **S**econdary)	Possible Cause of Distress (traffic loading, base failure, drainage issue, etc.)
Longitudinal Cracking (Wheelpath)	Yes	Moderate	Extensive	Primary	Traffic Loading, Base Failures
Fatigue Cracking / Alligator Cracking	Yes	Moderate	Extensive	Primary	Traffic Loading, Base Failures
Potholes / Patching	Yes	Low	Isolated	Secondary	Traffic Loading, Base Failures
Edge Cracking	Yes	Low	Isolated	Secondary	Traffic Loading, Base Failures
Rutting (of Granular Base)	Yes	Low	Isolated	Secondary	Traffic Loading, Base Failures

Notes:

Functional Distresses	Distress Type Present? (**Y**es / **N**o)	Severity Level (**L**ow / **M**oderate / **H**igh)	Extent Level (**I**solated / **E**xtensive)	Distress Level (**P**rimary / **S**econdary)	Possible Cause of Distress (environmental, oxidation/aging, truck traffic, soft binder, etc.)
Transverse / Thermal Cracking	Yes	Moderate	Isolated	Secondary	Environmental, oxidation/agin
Longitudinal Cracking (Non-Wheelpath)	Yes	Low	Isolated	Secondary	Environmental, oxidation/agin
Block Cracking	Yes	Moderate	Isolated	Secondary	Environmental, oxidation/agin
Raveling	No	NA	NA	NA	NA
Rutting (of Asphalt Surface)	Yes	Low	Isolated	Secondary	Truck Traffic, Base Failure
Bleeding / Flushing	No	NA	NA	NA	NA
Shoving / Pushing	No	NA	NA	NA	NA
Water Bleeding / Pumping	No	NA	NA	NA	NA

Notes:

Treatment Category Selection

Please select the top 3 "primary" distresses driving the need for roadway repair:

1 Fatigue Cracking (wheelpath)

2 Longitudinal Cracking (wheepath)

3 Block Cracking

Based on the information provided, which treatment category is being pursued?

Pavement Preservation	
Minor Rehabilitation	
Major Rehabilitation	
Full Depth Reconstruction	X

Please provide a justification for the treatment category chosen based on the top 3 primary distresses in a brief narrative below. In addition, please include representative photos of the roadway surface, spaced appropriately to show the overall pavement condition (20 images minimum). These pictures should encompass the entire cross section of the roadway curb-to-curb and be taken in the direction of travel.

This project includes roadway reconstruction for 200 feet on both sides of the bridge, so it's a short section of roadway. The existing pavement is over 20 years old and the predominant distresses are fatigue cracking and wheelpath longituinal cracking. These are structural distresses. The roadway is too far gone for preservation and rehabilitation treatments. Full depth reconstruction is recommended.

Additional Notes / Comments

10 images are provided as this is a short stretch of roadway.

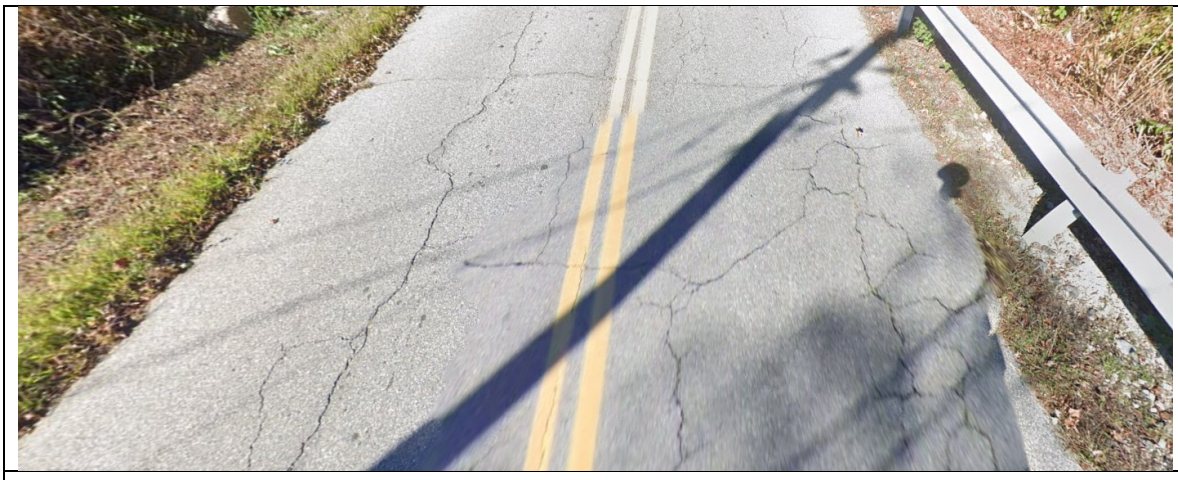


Photo 1 @ Southern Limits of Reconstruction Looking North



Photo 2 Moving North in Direction of Traffic



Photo 3 Moving North in Direction of Traffic



Photo 4 Moving North in Direction of Traffic



Photo 5 Moving North in Direction of Traffic



Photo 6 Moving North in Direction of Traffic



Photo 7 Moving North in Direction of Traffic

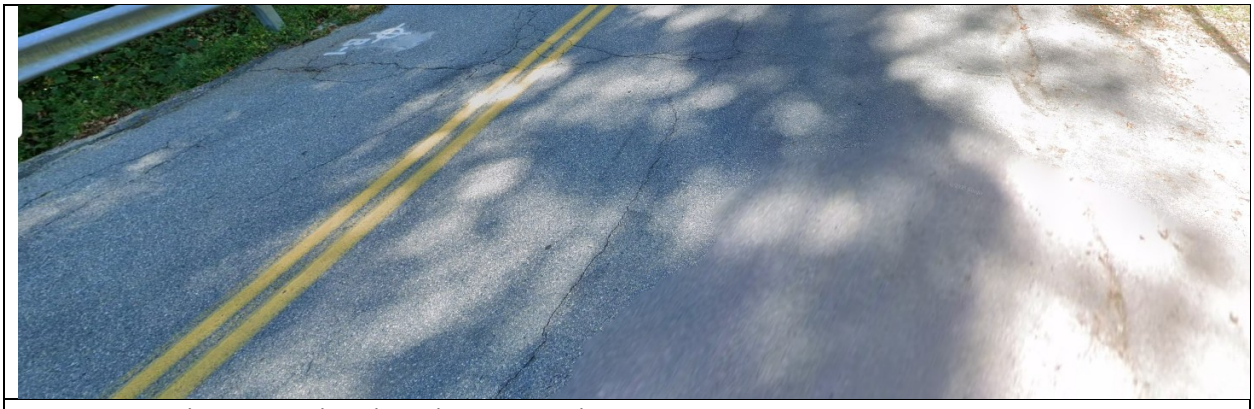


Photo 8 Moving North in Direction of Traffic



Photo 9 Moving North in Direction of Traffic



Photo 10 Moving North in Direction of Traffic

11. LOTCIP Application Section Q – Other

Attachment Page Addressing Section Q

(Q) Other – Flooding and Overtopping of Bridge

This area of Lantern Hill Road was severely flooded in 2010, and overtopping of the subject bridge (No. 71009) occurred. As a result, the header of Bridge No. 71009 was washed out and damaged (see photo below).



March 2010 flood damage to Bridge No. 71009, where the header was washed out.

Following the March 2010 floods, the Southeastern Connecticut Council of Governments (SCCOG) Hazard Mitigation Plan was updated with annexes, including for Ledyard[1]. Mitigation strategies that were identified included making improvements to culverts that have inadequate capacity to help reduce flooding risks[2], which in turn will prevent damage to roadways, such as Lantern Hill Road.

This section of Lantern Hill Road continues to be at high risk of flooding today, and was identified as such in a 2017 SCCOG publication. The Public Works Department must regularly clean and inspect the subject bridge culvert, and they are called when flooding occurs to make repairs. This places a financial and logistical burden on the town.

---

[1] Southeastern Connecticut Council of Governments, Hazard Mitigation Plan Update Annex for the Town of Ledyard, December 2017, Mitigation Plan Update for Town of Ledyard.

[2] Southeastern Connecticut Council of Governments, Hazard Mitigation and Climate Adaption Plan, March 2023, Hazard Mitigation and Climate Adaptation Plan.